Tanta University	Department: Computers and Control Engineering	Faculty of Engineering
	20 marks	

Course Title: Database Systems   Course Code: CCE3112 4th year
Date: 8/1/2015 (Midterm Exam of First term)   Allowed time: 40 minute

Answer the following questions:

Question No. 1   (10 marks)

1. Consider the database schema on the relations:

COURSE(Si, Number, Faculty, Course Title, Tutor)
STUDENTS (Number, Surname, FirstName, Faculty)
TUTORS (Number, Surname, FirstName, Faculty)
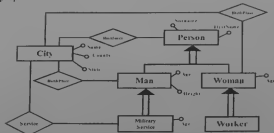EXAMS(Student, Course, Grade, Date)
STUDYPLAN (Student, Course, Year)

Based on this relation schema, Write a relational algebra expression for the following queries:

1- For every course in the engineering faculty, the students who passed the exam during the last session
2- The students who passed all the exams required by their respective study plan
3- For every course in the literature faculty, the student (or students) who passed the exam with the highest grade
4- The students whose study plan require them to attend lectures only in their own faculty
5- First name and surname of the students who have taken an exam with a tutor having the same surname as the students

2. Write an SQL statement for the queries in the previous problem.

Question No. 2   (10 marks)

1. Consider the given E-R schema: the schema represents various properties of men and women:

a) Correct the schema, taking into account the fundamental properties of the generalizations

b) The schema represents only the female workers, modify the schema to represent all the workers, men and women

c) Among the properties of cities, the State attribute can be seen also as an subproperty of the attribute County. Restructure the schema in this sense

2. Define an Entity -Relationship schema that describes the data of an application relating to a chain of automobile workshop. We are interested in:

- The workshop, with name (identifying), address and telephone number;
- The automobiles, with registration number (identifying) and model (a string of characters with no further structure) and owner;
- The customers (automobile owners), with social security number, surname, first name and telephone: each client can be the owner of more than one automobile.
- The maintenance work, carried out in a workshop, with a number (unique in a particular workshop), start date and end date, parts replaced (with quantities) and number of hours labour;
- The spare parts available with code, name and unit cost

Show the cardinalities of the relationships and (at least) one identifier for each entity.

Best wishes
Dr. Sherin El Gokhy